In the claims:

1. (Currently amended) A nucleotide comprising a sugar moiety selected from a natural sugar moiety and a sugar analog thereof, a natural phosphodiester or any other internucleosidyl linkage, and a natural pyrimidine or purine base or a base analog thereof, and a terminal thiol group at a side chain being covalently linked to the pyrimidine or purine base or base analog of the nucleotide, said side chain having at least 7 carbon atoms.

2. (Original) The nucleotide of claim 1, comprising a natural sugar moiety, a natural phosphodiester linkage, and a natural pyrimidine or purine base, and a terminal thiol group at a side chain being covalently linked to the pyrimidine or purine base of the nucleotide.

3. (Original) The nucleotide of claim 1, wherein said sugar moiety is ribose.

4. (Original) The nucleotide of claim 1, wherein said sugar moiety is deoxyribose.

5. (Original) The nucleotide of claim 1, wherein said sugar moiety is dideoxyribose.

6. (Original) The nucleotide of claim 1, which is a monophosphate, diphosphate, 3',5'-bisphosphate or 5'-triphosphate.

7. (Currently amended) The nucleotide of claim 1, wherein said side chain is saturated or unsaturated and has ~~2~~7-20 carbon atoms.

8. (Currently amended) The nucleotide of claim 7, wherein said saturated or unsaturated side chain has ~~2~~7-15 carbon atoms.

9. Canceled.

10. (Original) The nucleotide of claim 7, wherein said saturated or unsaturated side chain is interrupted by heteroatoms selected from the group consisting of O, S and N and/or is substituted by groups such as =O, =NH and/or 1-3 alkyl groups.

11. (Original) The nucleotide of claim 1, further comprising a metal cluster being covalently linked through said terminal thiol group at said side chain to the pyrimidine or purine base of the nucleotide.

12. (Original) The nucleotide of claim 11, wherein said metal is Ag, Au, Hg, Pt, Mo or W.

13. (Original) The nucleotide of claim 12, wherein said metal is Au.

14. (Original) The nucleotide of claim 13, wherein said metal cluster is colloidal gold.

15. (Original) A nucleic acid comprising at least one nucleotide of claim 1.

16. (Original) The nucleic acid of claim 15, comprising ribonucleotides.

17. (Original) The nucleic acid of claim 15, comprising deoxyribonucleotides.

18. (Original) The nucleic acid of claim 15, wherein said at least one nucleotide further includes a metal cluster covalently linked through said terminal

thiol group at said side chain to the pyrimidine or purine base or base analog of the nucleotide.

19. (Original) The nucleic acid of claim 18, wherein said metal is Ag, Au, Hg, Pt, Mo or W.

20. (Original) The nucleic acid of claim 19, wherein said metal is Au.

21. (Original) The nucleic acid of claim 20, wherein said metal cluster is colloidal gold.

22. (Original) A method for labeling a nucleic acid molecule at random locations with a metal, the method comprising incorporating a thiolated nucleotide according to claim 1 into said nucleic acid molecule, and attaching the metal atoms to the free thiol groups of the thiolated nucleic acid.

23. (Original) The method of claim 22 for the attachment of gold-clusters at random locations in a nucleic acid molecule, comprising:

(i) preparation of precursor deoxyribonucleoside triphosphates (NTPs) and ribonucleoside triphosphates (rNTPs) whose heterocyclic ring contains substituents with a terminal thiol group (NTP-SH and rNTP-SH, respectively);

(ii) incorporation of these precursor molecules into DNA or RNA in reactions catalyzed by DNA polymerase or RNA polymerase, respectively; and

(iii) attachment of gold-clusters to the free thiol groups, either by reacting with a commercially available maleimido derivative of the cluster, or by reacting with colloidal gold of pre-determined size.